Space Weather Forecast

Issued on Monday, 05 June 2023 at 13:23 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate flares (R1/Minor-R2/Moderate radio blackouts). Slight chance of a G1/Minor storm due to CME effects 07-08 June.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, but with frequent Common-Class flares. There are currently eight sunspot regions on the visible disc. the complex group nearing centre disk contributing the bulk of current flare risk. The previous large region in the southwest is rotating over the limb. A newer region near the southeast limb is still difficult to classify due to the viewing angle, but is starting to reveal some complexity. The other regions appear to be mostly smaller and/or simpler.

No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery during the period.

Solar Wind / Geomagnetic Activity: Solar winds have shown some disturbance. Wind speeds were ambient to start, varying between 310-380 km/s, increasing to slightly elevated 400-450 km/s from 05/0530 UTC. The total magnetic field has been at weak to moderate levels. The important north-south component, Bz, was moderately positive to start but fell negative between 04/1630 UTC and 04/1714 UTC, before returning to weak levels by around 04/1900 UTC and remaining so since. Geomagnetic activity was mostly Quiet (Kp 1-2), with an Active (Kp 4) interval 04/1800-2100UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to remain generally Low but there is a chance of Moderate activity, and a slight chance of isolated Strong flares.

Solar Wind / Geomagnetic Activity: A CME eruption around 04/0900UTC from the southwest quadrant is currently thought more likely to miss Earth, however a glancing blow is possible either late Day 3 or into Day 4 (07-08 June). Some transient enhancement of the solar winds has been observed in the past 24hrs and this may continue into the start of the period, in general however solar winds expected to remain generally slow-ambient to slightly elevated into the period with a slight chance of enhancement late Day 3 into Day 4 (07-08 June), should we see any CME effects.

Geomagnetic activity is forecast to be mainly Quiet to Unsettled with a slight chance of Active intervals on Day 1 and Day 2 (05-06 June), should we continue to see any transitory enhancement. Activity possibly increasing late Day 3 into Day 4 (07-08 June) should we see any CME effects, becoming more Unsettled with a chance of Active intervals and a slight chance of

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isolated G1/Minor storm intervals.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to be at background levels with solar radiation storms unlikely to occur. However, there is a slight but declining chance of reaching the S1/Minor Storm threshold should any larger flares occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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